Ten Things You Need to Understand About Broadband

Getting from Here to Big Broadband Everywhere

You have a vision of a ubiquitous, user-centric broadband system in the U.S. — one that enables innovation from all sectors. You know that policy, technology and economic interests should work together to delve into new solutions, new technologies, and new social engagements that enable user-centric broadband deployment and unrivaled opportunities for innovation, jobs, and economic development. In this vision, you see:

- Universal broadband adoption in every community, every household, and every business.
- Enablement of affordable, ubiquitous broadband solutions, which meet the country's 'grand challenges': healthcare, public safety, education, civic participation, energy independence/efficiency, and economic growth.
- Widespread local, state, and federal understanding of the importance of broadband, particularly,
  - Identification of areas where public resources are needed to provide universal service
  - Federal, state, and local policies that are required for sustainable self-sufficient, broadband-enabled communities.

But, how do we get from where we are today to Big Broadband Everywhere? Here are ten things you need to understand.

One. Open infrastructure is an essential building block to universal broadband.

Two. Broadband Adoption = Access + Applications + Affordability + Accessibility + Assistance

Three. There are many different roadblocks to adoption in "underserved" communities.

Four. At least five factors must be measured to understand why an expensive-to-serve area has no or sparse broadband.

Five. Urban communities have the most nonadopters.

Six. Public-good "Grand Challenge" applications are the killer apps for government.

Seven. Subsidized middle-mile fiber combined with community connection points will catalyze first mile deployments in expensive-to-serve areas.

Eight. Successful programs that create new adoption must be feted and scientifically analyzed so we can replicate success.

Nine. Mapping is a-good-thing, but empirical data is better.

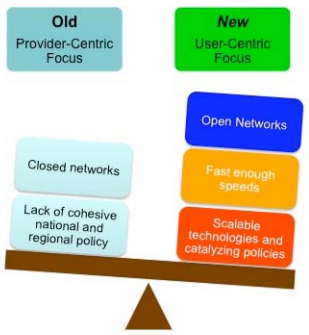
Ten. Sustained local leadership has the biggest and most dramatic effect on creating broadband demand, creating a community broadband spirit and attracting the attention of communications providers.

Keep reading if you want to know more…

1. Open infrastructure is an essential building block to universal broadband.

Open networks/infrastructure are the solution to enable user innovation on the widest possible scale. Typical U.S. broadband deployments are based on the concept of vendor-controlled networks. Vendor-controlled networks usually restrict the use of the network connection to their own provided services (voice, Internet, TV, etc.) and, thereby, control the applications and content available to subscribers.

The world is moving towards a much more consumer-robust concept of open networks. A recent report from the Big Think group of international broadband experts describes the open network idea. "The big picture idea about communications is an open network. Everyone understands what it means for a network to be open: (1) the network offers a pure "transmission" service, so that users can freely communicate with each other; (2) users can connect any devices they want, as long as they don't harm the network; (3) the network connects to other networks; and (4) the network doesn't discriminate among users or among the services, information, and applications users want to provide to each other."



We need to shift the priority from 'last mile' provider-centric networks to 'first mile' user-centric networks.

2. *ADOPTION* = Access + Applications + Affordability + Accessibility + Assistance

The goal is widespread adoption of broadband. There are a bunch of factors that keep people from adopting broadband including:

- Access – is it there?
- Applications that make broadband a necessary, useful purchase
- Affordability -- cost-effective (value) and structured for adoption (no contracts)
- Accessibility for all potential users especially through universal design
- Assistance through community-based organizations and others that catalyze ICT literacy and other factors that drive broadband demand and adoption

Broadband adoption can be characterized using the Five A's of Adoption model.

3. There are many different roadblocks to adoption in "underserved" communities.

Great confusion exists about what constitutes unserved and underserved communities, where they are located, and the issues creating roadblocks to adoption. This confusion is clear when comparing urban underserved communities with low adoption rates to rural underserved communities with no access to broadband services. A set of definitions that encompass the various aspects of the five A's of adoption and that are unique to individual underserved communities must be created so that no confusion remains and the path forward is clear to all.

4. At least five factors must be measured to understand why an expensive-to-serve area has no or sparse broadband.

FirstMile.US has developed criteria for expensive-to-serve underserved areas called *A Comprehensive Determination of Broadband Deployment to Designate Unserved and Underserved Communities Using Fact-based Measurement Criteria*. We believe these criteria can help the federal, state and local entities on

two levels: 1) in determining the need for subsidized funding and 2) in helping determine how to develop regional solutions to maximize subsidized investments (i.e., middle-mile, open-infrastructure construction.) These five criteria are:

- Price
- Coverage
- Number of providers, especially the availability of open infrastructure
- Highest upload and download speeds
- Backhaul/middle-mile availability

5. Urban communities have the most nonadopters.

We believe that densely populated areas require different operating definitions for "unserved" and "underserved" than do rural areas. The reasons why households and businesses are not adopting broadband, particularly when there is ready access to services, may be different from the lack of access to service found in rural areas, but they are just as powerful. Because of this, it is imperative that a different definition be used for underserved urban communities that are not adopting broadband. The definition for underserved should be tied to measurable, empirically verifiable criteria that are known predictors of low broadband adoption. These include but are not limited to:

- Median income
- Head of household education level
- Whether English is second language
- Concrete measures of the level of ICT literacy (homes with low adoption of technology)
- Median age of residents
- Mean, median, and modal education level within the household

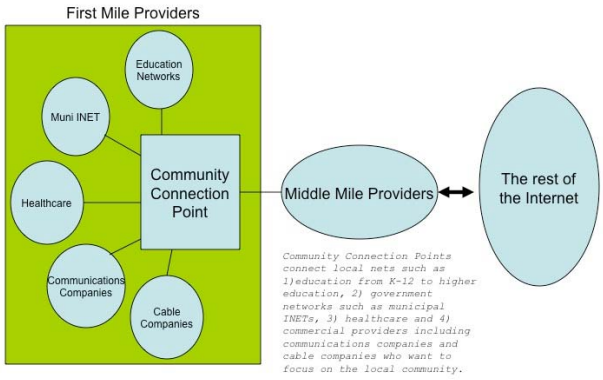
6. Public-good "Grand Challenge" applications are the killer apps for government.

We believe that Congress and the White House have been very clear with the American public about where the country's 'grand challenges' lie: healthcare, public safety, education, civic participation, energy independence/efficiency, and economic growth.

The public-good "grand challenge" applications should be defined and the minimum network characteristics (speeds, latency, symmetry) that are required to serve them. This is an essential component in evaluating the minimum acceptable level of broadband services and provides a yardstick to measure forward progress – driving better understanding of technology scalability.

7. Subsidized middle-mile fiber combined with community connection points will catalyze first mile deployments in expensive-to-serve areas.

Through funding of strategically located "open" middle mile infrastructure(s) paired with low-cost, regional "community connection points" (also known as exchange/peering/transit points), subsidies can effectively ameliorate the enormous costs that have prevented many local broadband buildouts.



The Community Connection Point is a natural conduit for open infrastructure – allowing interconnection amongst providers and integration of grand challenge applications.

Funded middle mile infrastructure should:

- Be open and offer a pure transmission service with no discrimination among users or among the services, information, and applications users want to provide to each other.
- Be regional and serve multiple communities along its path.
- Provide interconnection points at reasonable intervals as needed by local service providers.
- Create an ownership structure that provides a long-term pricing advantage to the region served. Novel concepts should be encouraged such as fiber condominiums, public joint powers ownership, and cooperatives.

- Include 'huts' for community connection points and agreements among service providers on how to best interconnect the region.

Community connection points (CCP) are the building blocks of new networks. One can think of the community connection point as a very small, very cheap central office for broadband—in essence, a broadband commons. Peering among local networks, which allows providers to send and receive traffic from each other, occurs within the connection point.

8. Successful programs that create new adoption must be feted and scientifically analyzed so we can replicate success.

Statistics show that vast majority of people who do not have broadband in the home or workplace are in areas where there is access to broadband, but for some reason have not purchased service. We believe it is important to specifically target nonadopters. These programs address applications, training, public awareness initiatives, and workforce development with the goal of increasing adoption rates. Many community-based organizations, educational institutions and libraries are doing remarkable work in this area.

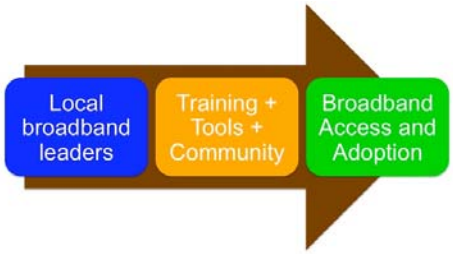
9. Mapping is a-good-thing, but empirical data is better.

A national map is a smart strategy in order to help understand the magnitude of the broadband problem this nation is facing. We all must remember one important fact: a map is simply a visual representation of "other" data. It is important to map factors that affect adoption using scientifically valid assumptions. Examples include:

- Whether the service was accessible—physically and financially, to the entire population or just a subset,
- Whether people had the equipment they needed to use it, and
- A very precise, granular series of measures of adoption.

Some basic map criteria are:

- Verifiable, reliable data sources that can be validated (i.e. Census)
- Standardized GIS schema at a national level
- More data than the combined upload/download speeds
- Determination of the logical geographical segments needed to understand the true nature of broadband deployment for federal, tribal, state and local entities



Local broadband leadership is an essential component in sustainable, thriving broadband implementations.

10. Sustained local leadership has the biggest and most dramatic effect on creating broadband demand, creating a community broadband spirit and attracting the attention of communications providers.

The adage, "All politics is local" holds true for creating broadband demand. In essence, "politics always was about values combined with instincts" and communities must take their local core values and marry them with the "broadband instinct." FirstMile.US is leading the leaders through its *Broadband Leadership Corps*. We're providing training, programs, and forums to assist in developing local broadband leadership.

About FirstMile.US

FirstMile.US is 501c3 nonprofit organization headquartered in California. Since 2005, our mission has been to educate and advocate regarding the promise of big broadband in the United States. Our vision is that every member of the American public has access to big broadband, the 21st century pathway to a better overall quality of life. The five A's of adoption is a creation of the California Emerging Technology Fund and we use it because we think it's good. Visit us at http://www.firstmile.us.